

Claims

What is claimed is:

1. A method for managing system resources, comprising:
creating a container, wherein creating the container comprises allocating a first portion of
a first resource to the container;
associating the container with a resource pool, wherein the resource pool is associated
with the first resource;
determining whether the first portion of the first resource is valid; and
activating the container if the first portion of the first resource is valid.
2. The method of claim 1, further comprising:
executing a project within the container once the container is active.
3. The method of claim 2, further comprising:
collecting statistics corresponding to the executing of the project in the container.
4. The method of claim 2, further comprising:
triggering an alert if the project executing within the container attempts to use more than
the first portion of the first resource.
5. The method of claim 2, wherein the project does not use more than the first portion of the
first resource while executing in the container.
6. The method of claim 2, wherein the project is placed in the container by a user listed on an
access control list associated with the container.
7. The method of claim 1, further comprising:
allocating a second portion of the first resource to the container, if the first portion of the
first resource allocated to the container is not valid;
determining whether the second portion of the first resource allocated to the container is
valid; and

activating the container if the second portion of the first resource allocated to the container is valid.

8. The method of claim 1, further comprising:
 - allocating a first portion of a second resource to the container;
 - determining whether the first portion of the second resource allocated to the container is valid.
9. The method of claim 1, further comprising:
 - deactivating the container, wherein deactivating the container comprises releasing the first portion of the first resource from the container.
10. The method of claim 9, further comprising:
 - transferring the project executing the container to a default container if the container is deactivated; and
 - executing the project in the default container.
11. The method of claim 1, further comprising:
 - modifying the first portion of the first resource after the container is activated.
12. The method of claim 11, wherein the first portion of the first resource is modified using schedule change job functionality.
13. The method of claim 1, wherein creating the container comprises:
 - defining a container name;
 - specifying a minimum CPU requirement for the container;
 - specifying a maximum physical memory limit; and
 - specifying a maximum outgoing network bandwidth.
14. The method of claim 12, wherein creating the container further comprises:
 - specifying a project associated with the container, wherein the project corresponds to a plurality of processes.

15. The method of claim 13, wherein each of the plurality of processes is identified by the same identifier.
16. The method of claim 1, wherein the first resource is at least one selected from the group consisting of a central processing unit (CPU), physical memory, and bandwidth.
17. A resource management system, comprising:
 - a first resource and a second resource;
 - a first resource pool, wherein the resource pool is allocated a portion of the first resource and a portion of the second resource;
 - a first container residing in the first resource pool, wherein the first container comprises a requirements specification for the first resource for the first container and a requirements specification for the second resource for the first container; and
 - a management interface configured to:
 - verify the requirements specification for the first resource with the allocated portion of the first resource, and
 - verify the requirements specification for the second resource with the allocated portion of the second resource.
18. The system of claim 17, further comprising:
 - a database configured to track:
 - allocation of the first resource;
 - allocation of the second resource;
 - the requirements specification of the first resource for the first container; and
 - the requirements specification of the second resource for the first container.
19. The system of claim 17, further comprising:
 - a second container residing in the first resource pool, wherein the second container comprises a requirements specification the first resource for the second container and a requirements specification for the second resource for the second container;
20. The system of claim 19, wherein the usage of the first resource and the second resource by the first container and the second container is determined using fair share scheduling.

21. The system of claim 17, wherein the management interface is configured to modify the requirements specification for the first resource for the first container.
22. The system of claim 21, wherein the requirements specification for the first resource for the first container is modified using schedule change job functionality.
23. The system claim 17, further comprising:
 - a project configured to execute in the first container, wherein the project corresponds to a network-wide administrative identifier used to identify related processes.
24. The system of claim 23, wherein the amount of the first resource used to execute the project in the first container does not exceed the portion of the first resource allocated to the first container.
25. The system of claim 23, wherein the amount of the first resource used to execute the project in the first container does not exceed the requirements specification of the first resource for the first container.
26. The system of claim 23, wherein the management interface is configured to track usage of the first resource and the second resource by the project.
27. The system of claim 23, wherein the project is placed in the first container by a user listed on an access control list associated with the first container.
28. The system of claim 17, further comprising:
 - a first management utility configured to manage the first resource; and
 - a second management utility configured to manage the second resource,wherein the management interface is further configured to interface with the first management utility and the second management utility to manage the portion of the first resource and the portion of the second resource allocated to the resource pool.
29. The system of claim 17, wherein the management interface is further configured to discover the first resource and the second resource.

30. The system of claim 17, wherein the first container comprises:
- a container name;
 - a minimum CPU requirement for the container;
 - a maximum physical memory limit;
 - specifying a maximum outgoing network bandwidth.
31. The system of claim 17, wherein the first resource is at least one selected from the group consisting of a central processing unit (CPU), physical memory, and bandwidth.
32. A network system having a plurality of nodes, comprising:
- a first resource and a second resource;
 - a first resource pool, wherein the resource pool is allocated a portion of the first resource and a portion of the second resource;
 - a first container residing in the first resource pool, wherein the first container comprises a requirements specification for the first resource for the first container and a requirements specification for the second resource for the first container; and
 - a management interface configured to:
 - verify the requirements specification for the first resource with the allocated portion of the first resource, and
 - verify the requirements specification for the second resource with the allocated portion of the second resource,
- wherein the first resource is located on any one of the plurality of nodes,
wherein the second resource is located on any one of the plurality of nodes,
wherein the first resource pool is located on any one of the plurality of nodes,
wherein the container is located on any one of the plurality of nodes,
wherein the management interface executes on any one of the plurality of nodes.